

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,224,029 B2
APPLICATION NO. : 10/707964
DATED : May 29, 2007
INVENTOR(S) : Anderson et al.

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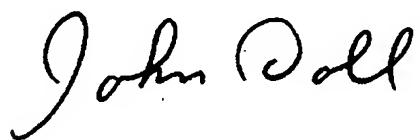
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

The title page showing the illustrative figure should be deleted to be replaced with the attached title page.

The drawing sheets, consisting of Figs. 1A-15, should be deleted to be replaced with the drawing sheets, consisting of Figs. 1A-15, as shown on the attached page.

Signed and Sealed this

Seventeenth Day of February, 2009



JOHN DOLL
Acting Director of the United States Patent and Trademark Office

(12) United States Patent
Anderson et al.(10) Patent No.: US 7,224,029 B2
(45) Date of Patent: May 29, 2007

(54) METHOD AND STRUCTURE TO CREATE MULTIPLE DEVICE WIDTHS IN FINFET TECHNOLOGY IN BOTH BULK AND SOI

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 66 days.

(21) Appl. No.: 10/707,964

(22) Filed: Jan. 28, 2004

(65) Prior Publication Data

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(51) Int. Cl.

H01L 21/36 (2006.01)

H01L 27/01 (2006.01)

(52) U.S. Cl. 257/347; 257/350; 257/351; 257/369; 257/344; 257/296

(58) Field of Classification Search 257/200, 257/201, 202, 207, 205, 349, 350, 351, 374, 257/208, 369, 370, 371, 376

See application file for complete search history.

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* cited by examiner

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Assistant Examiner—Fazli Erdem

(74) Attorney, Agent, or Firm—Gibb I.P. Law Firm, LLC; William D. Sabo, Esq.

(57) ABSTRACT

Disclosed is a structure and method for producing a fin-type field effect transistor (FinFET) that has a buried oxide layer over a substrate, at least one first fin structure and at least one second fin structure positioned on the buried oxide layer. First spacers are adjacent the first fin structure and second spacers are adjacent the second fin structure. The first spacers cover a larger portion of the first fin structure when compared to the portion of the second fin structure covered by the second spacers. Those fins that have larger spacers will receive a smaller area of semiconductor doping and those fins that have smaller spacers will receive a larger area of semiconductor doping. Therefore, there is a difference in doping between the first fins and the second fins that is caused by the differently sized spacers. The difference in doping between the first fins and the second fins changes an effective width of the second fins when compared to the first fins.

11 Claims, 15 Drawing Sheets

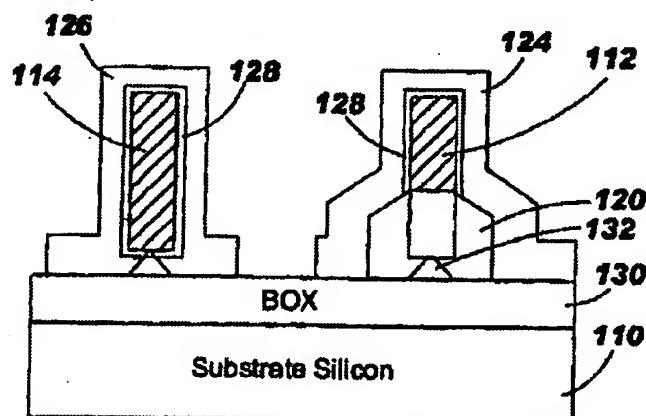


FIG. 1A

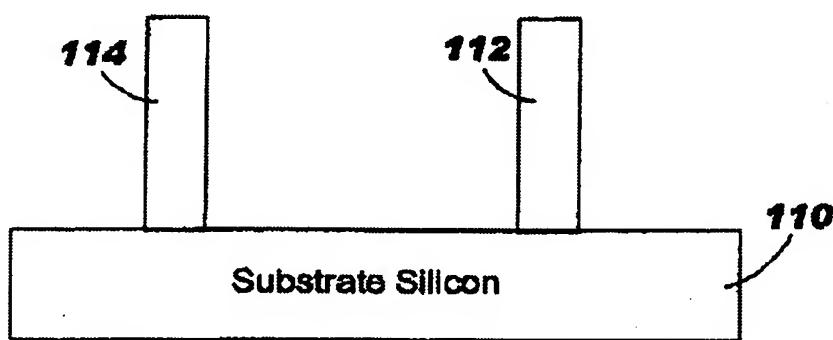


FIG. 1B

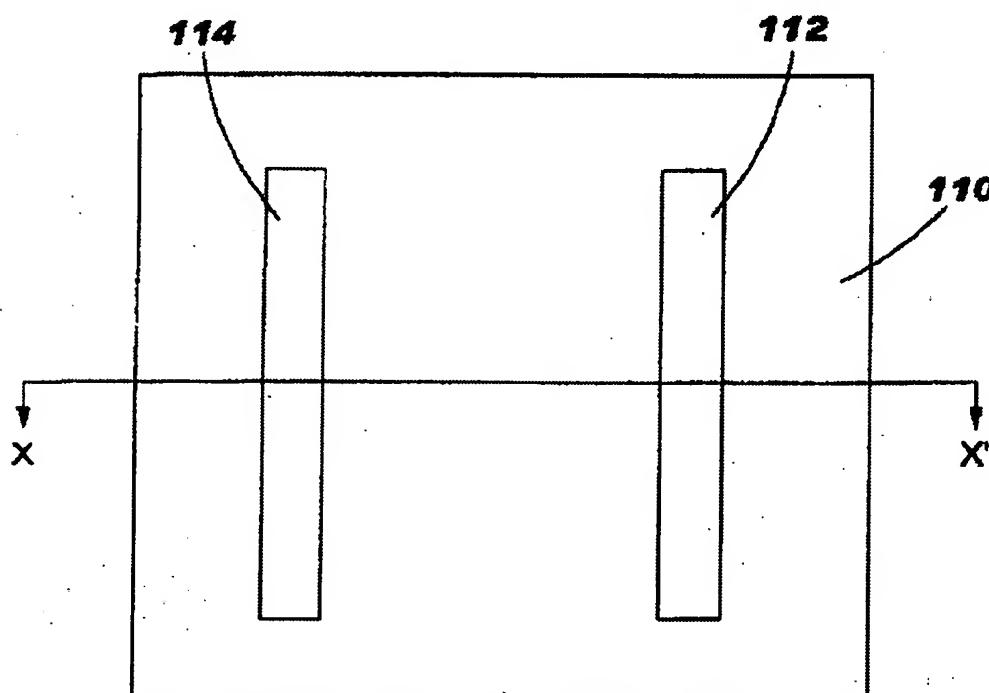


FIG. 2A

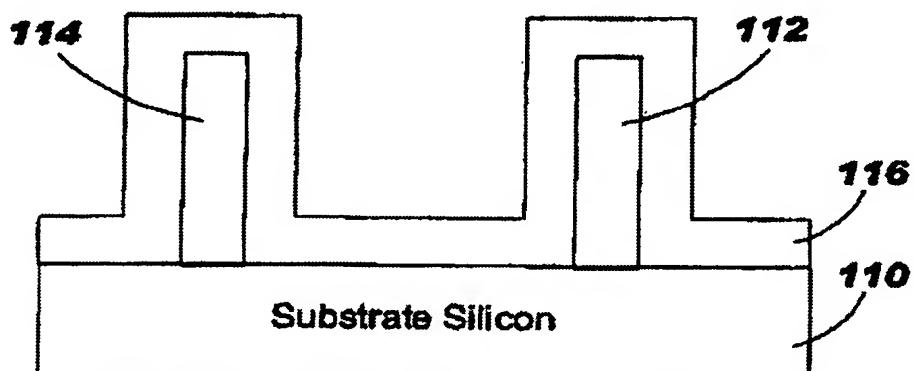


FIG. 2B

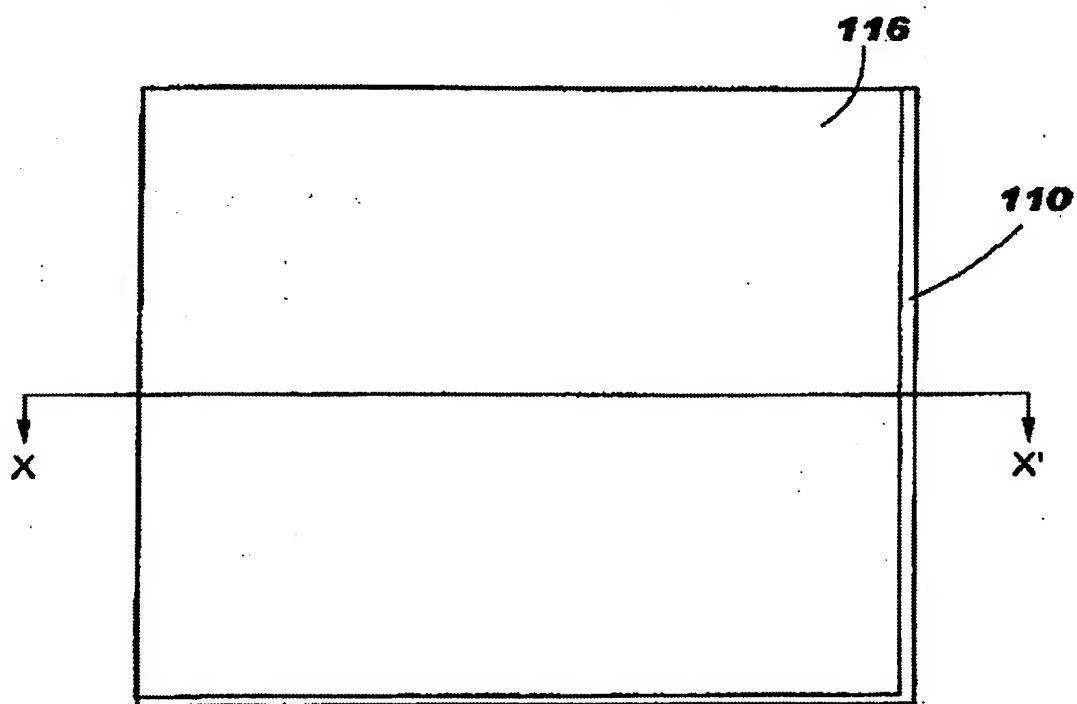


FIG. 3A

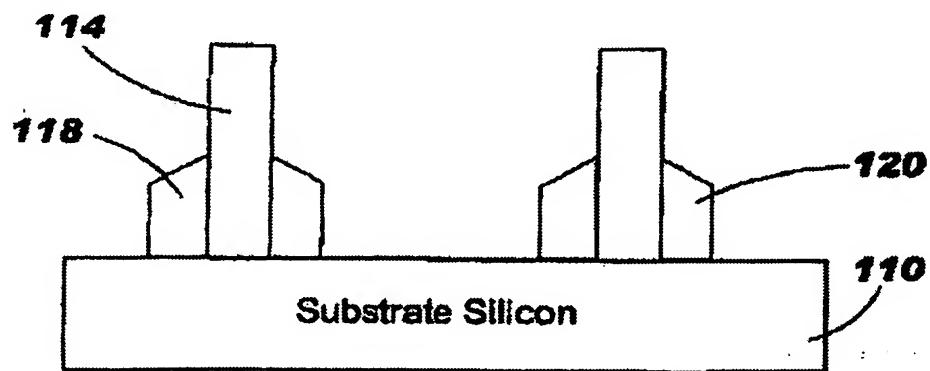


FIG. 3B

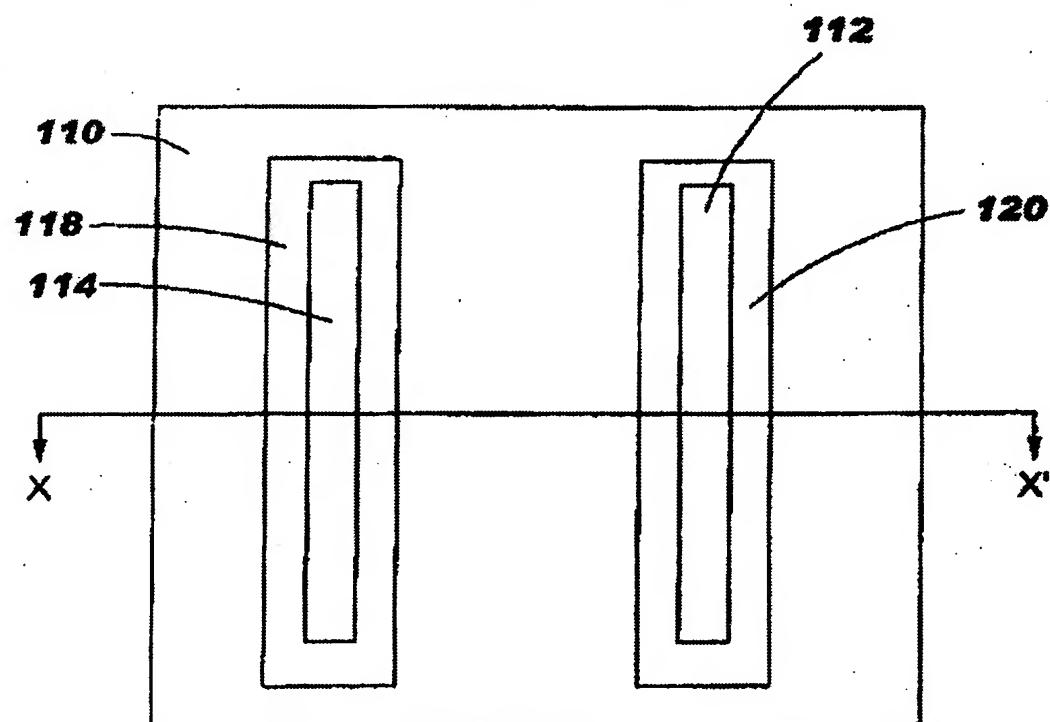


FIG. 4A

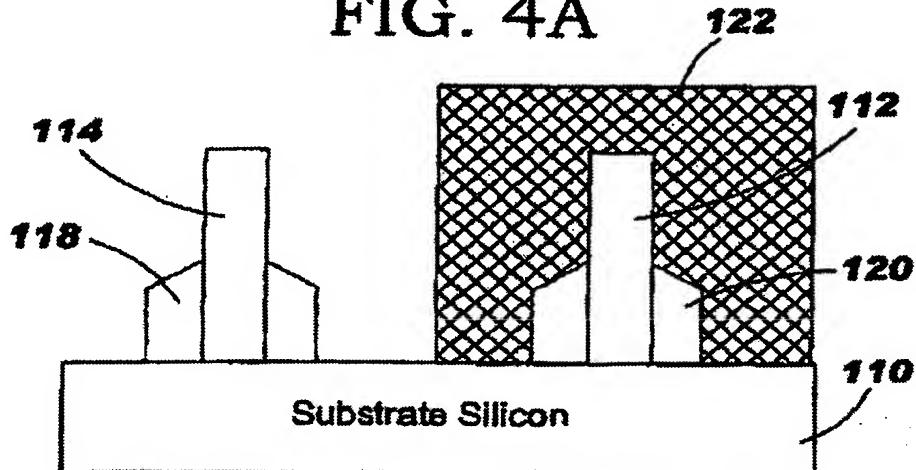


FIG. 4B

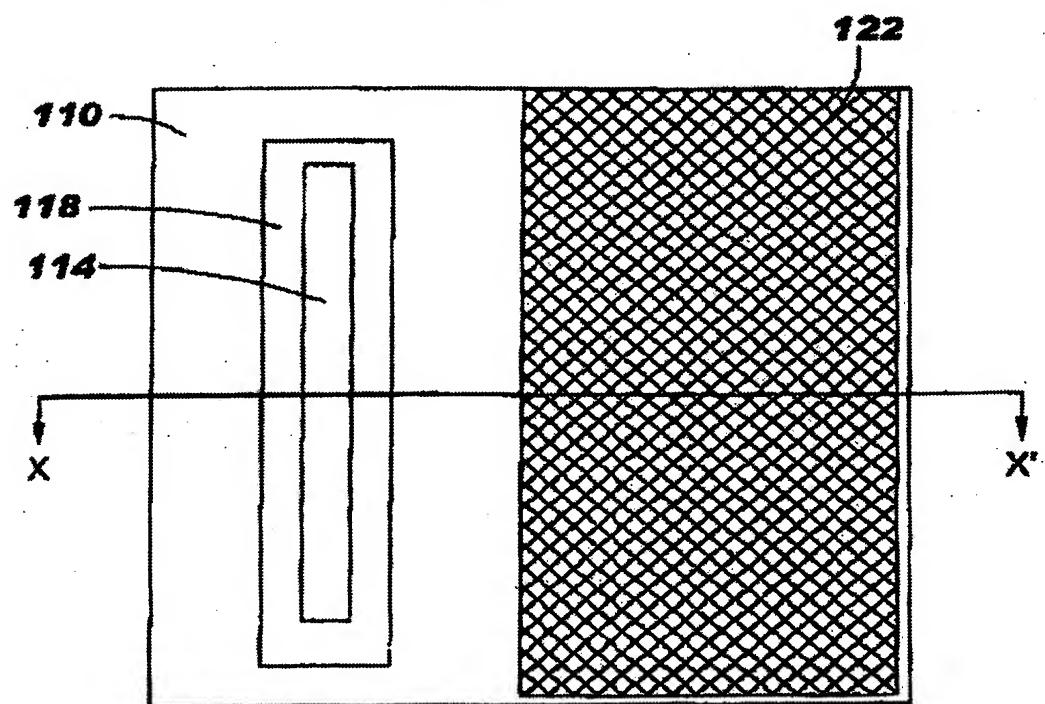


FIG. 5A

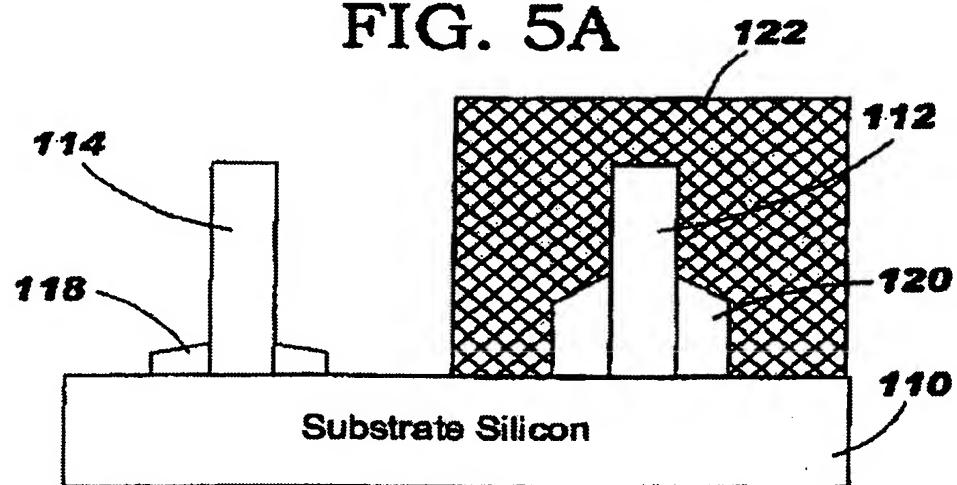
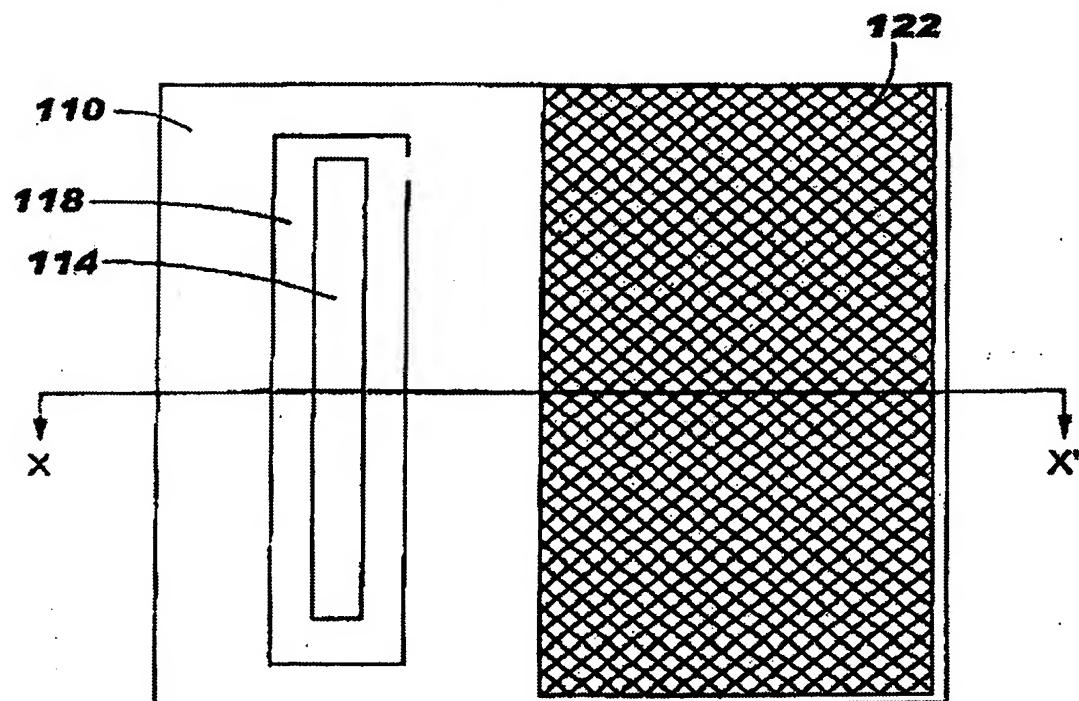


FIG. 5B



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FIG. 6A

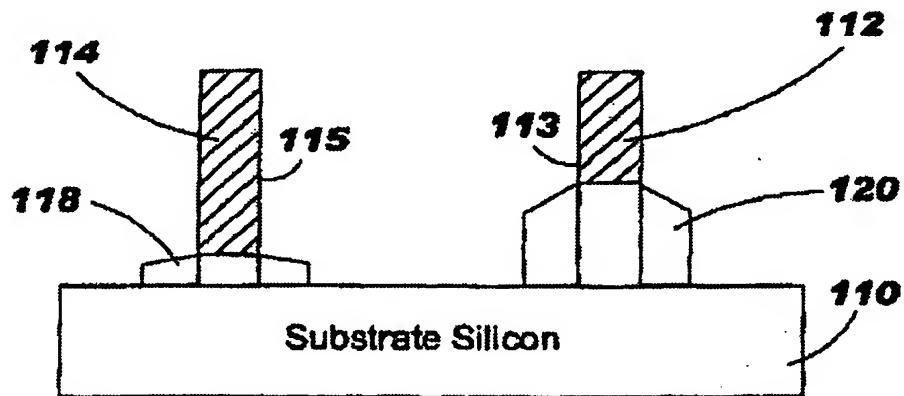


FIG. 6B

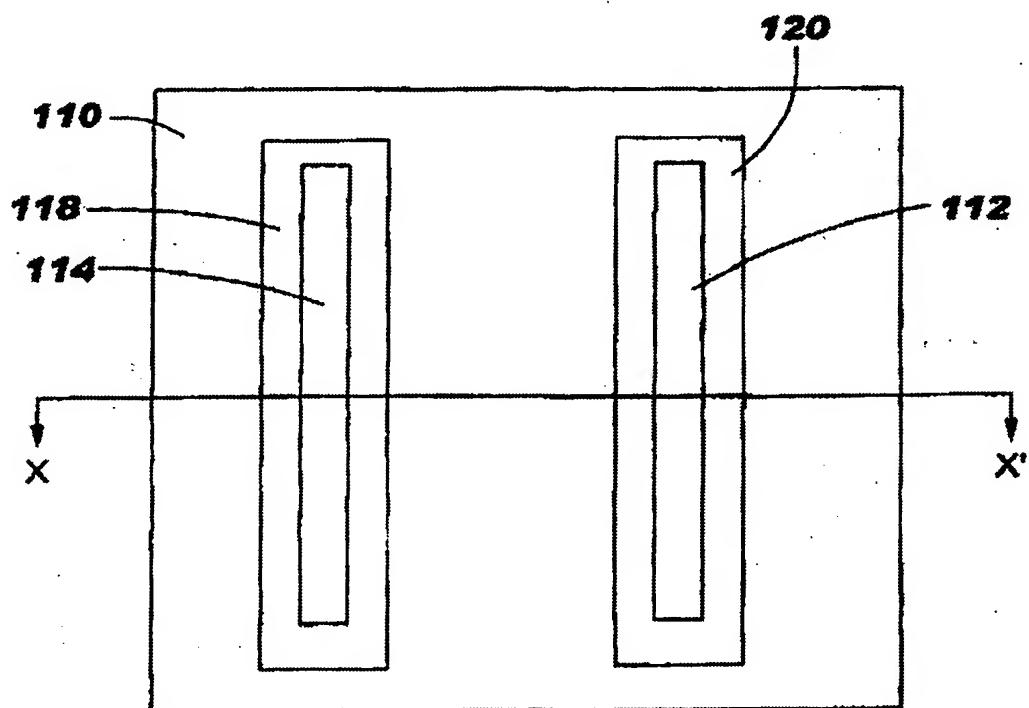


FIG. 7A

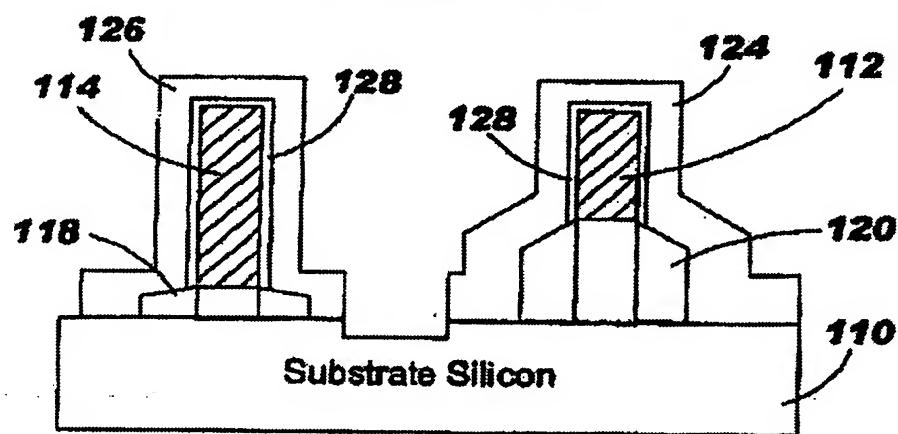


FIG. 7B

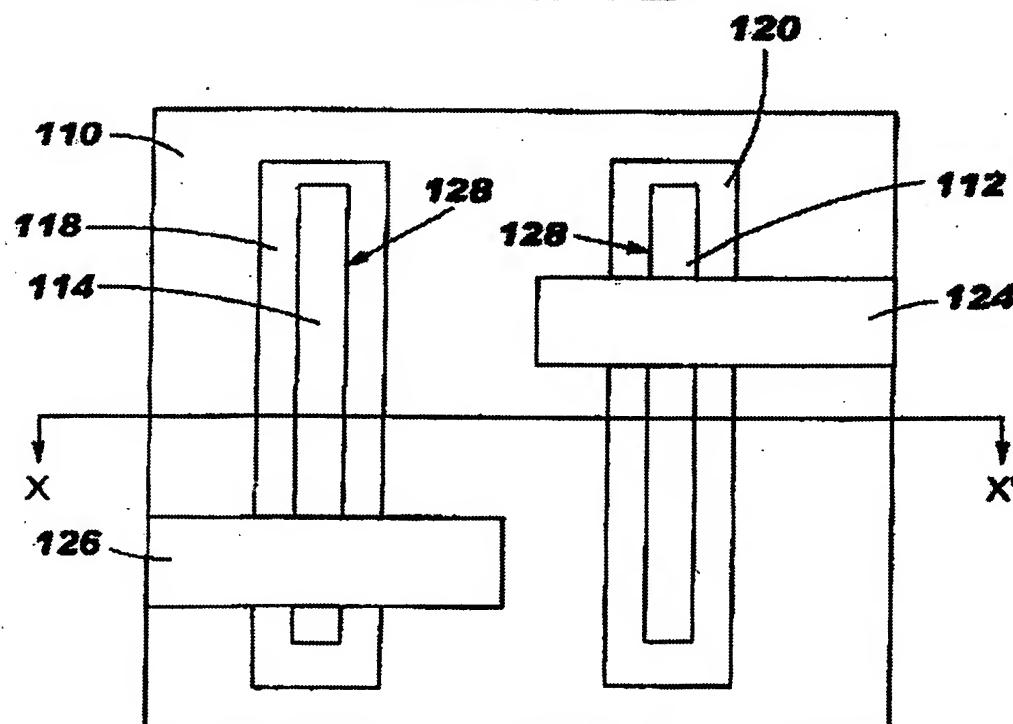


FIG. 8A

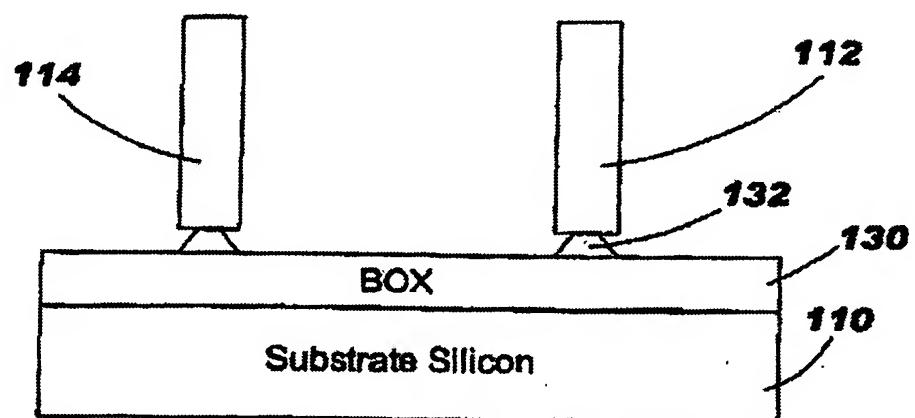


FIG. 8B

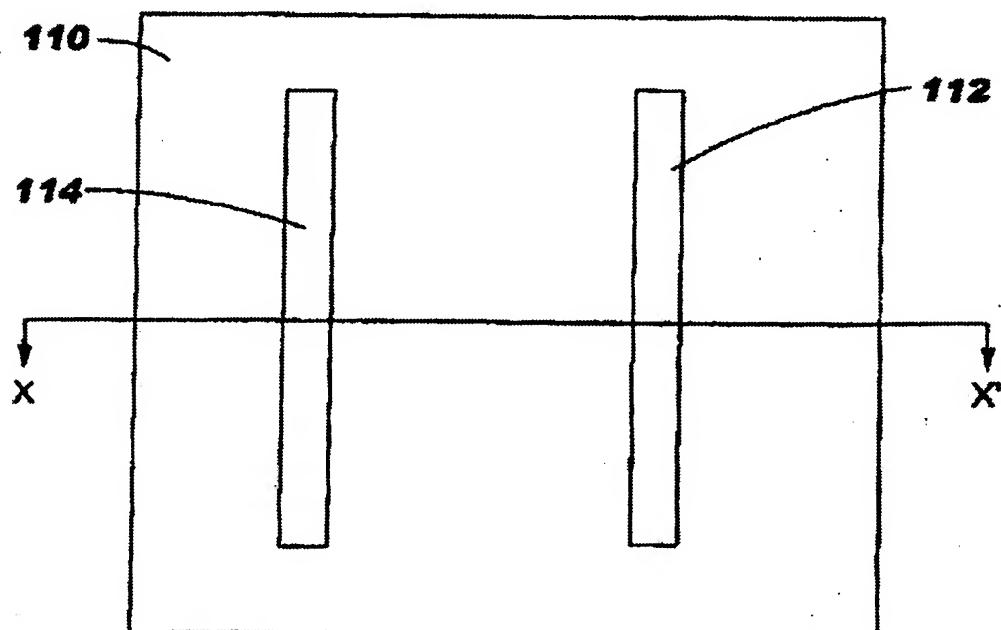


FIG. 9A

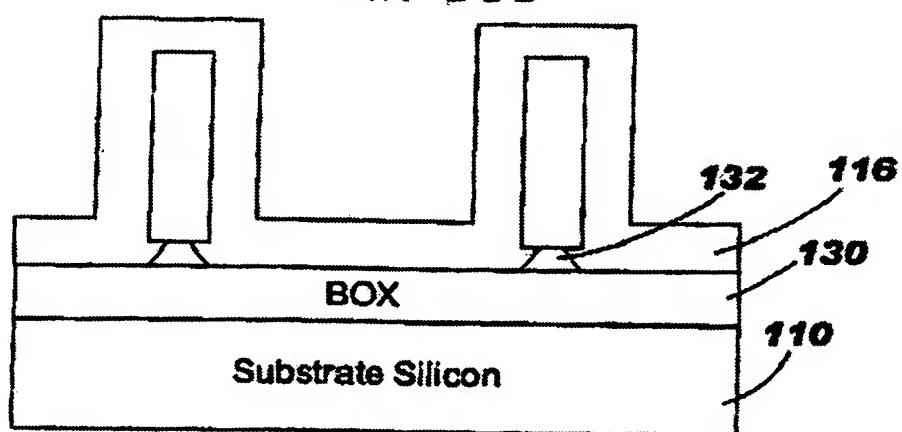


FIG. 9B

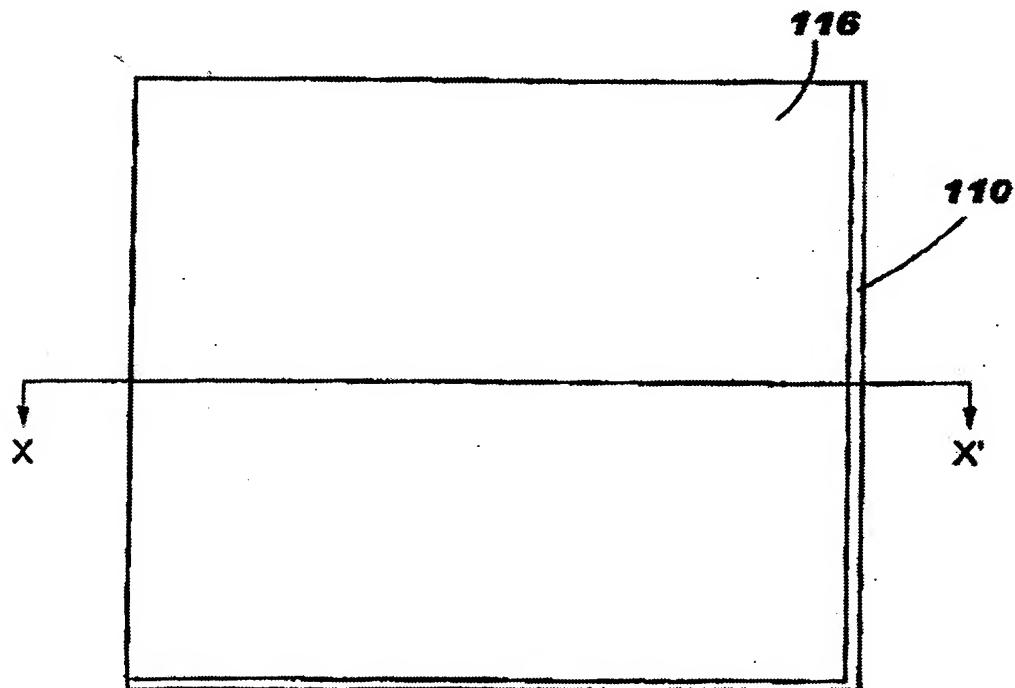


FIG. 10A

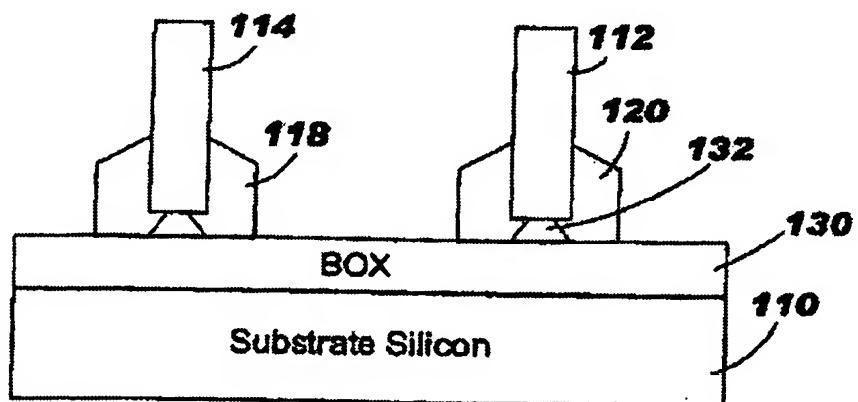


FIG. 10B

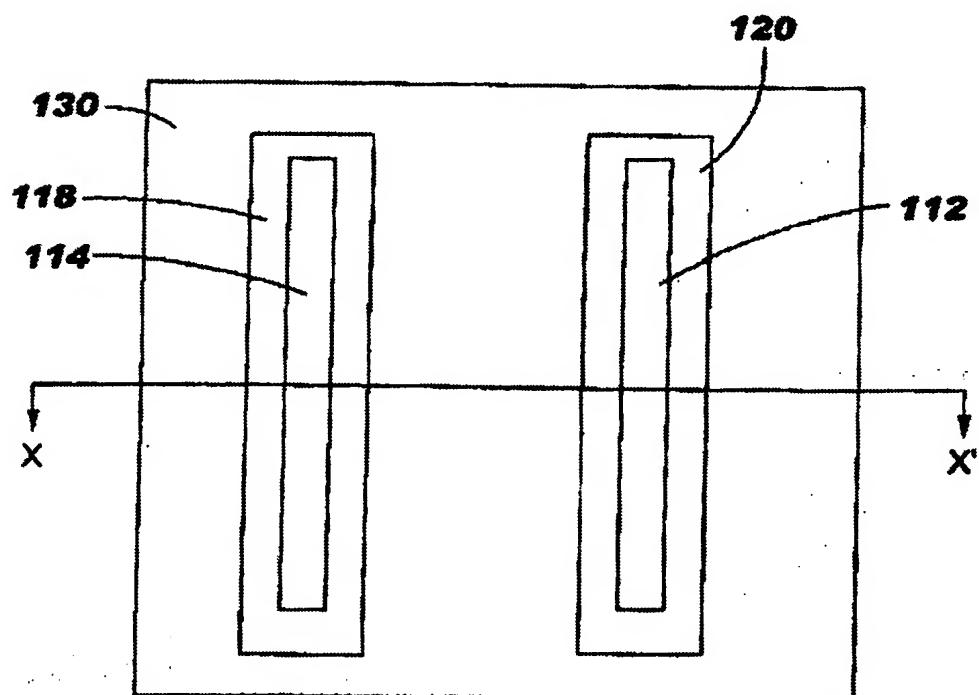


FIG. 11A

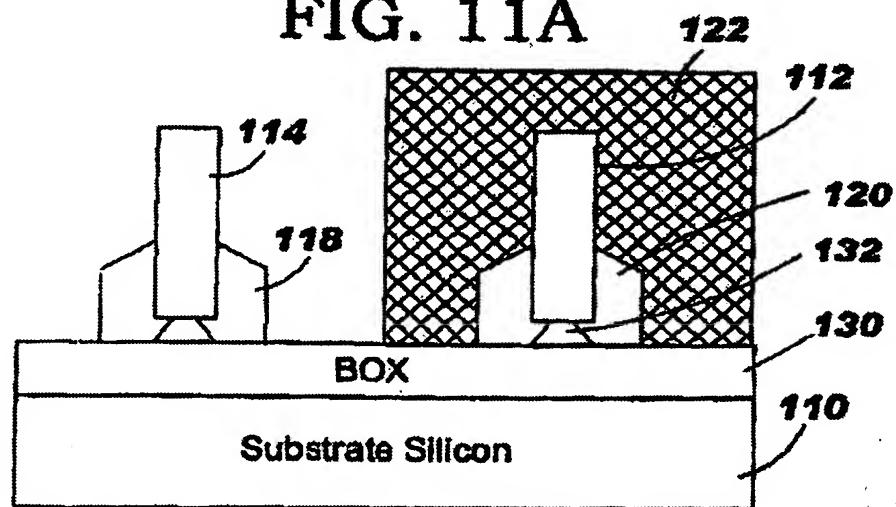


FIG. 11B

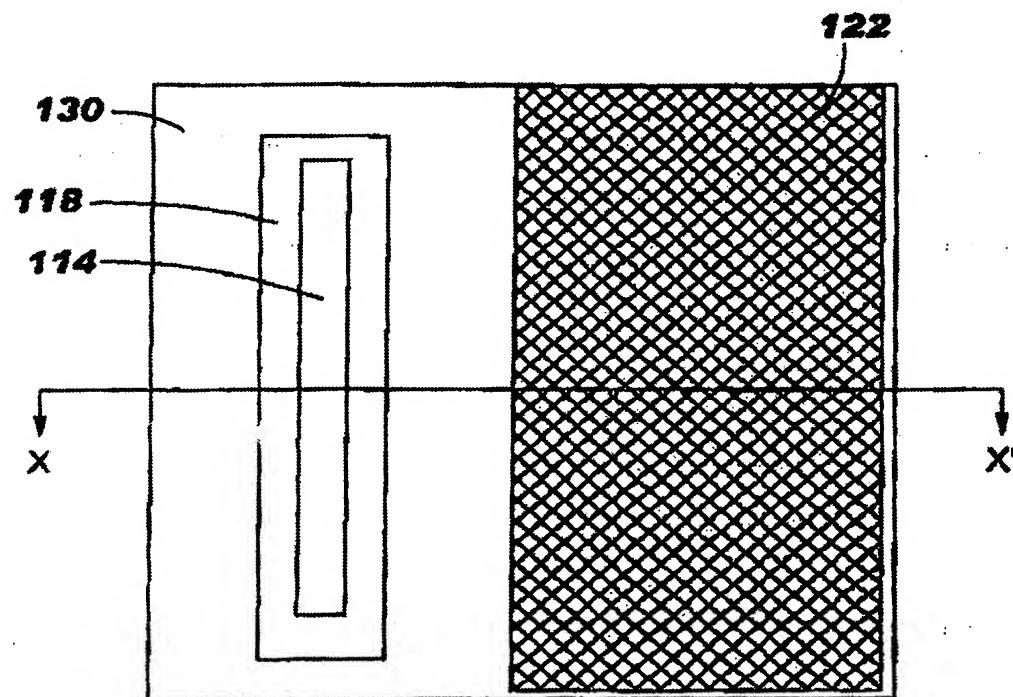


FIG. 12A

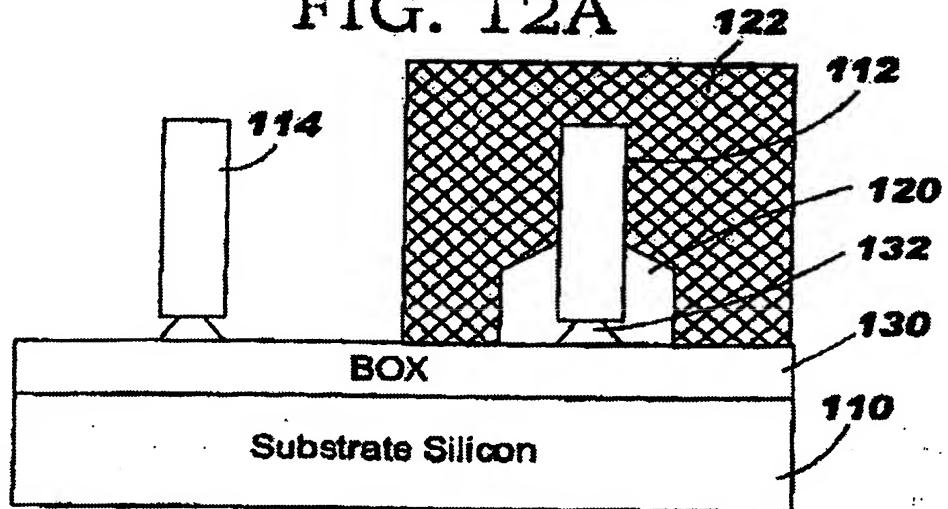


FIG. 12B

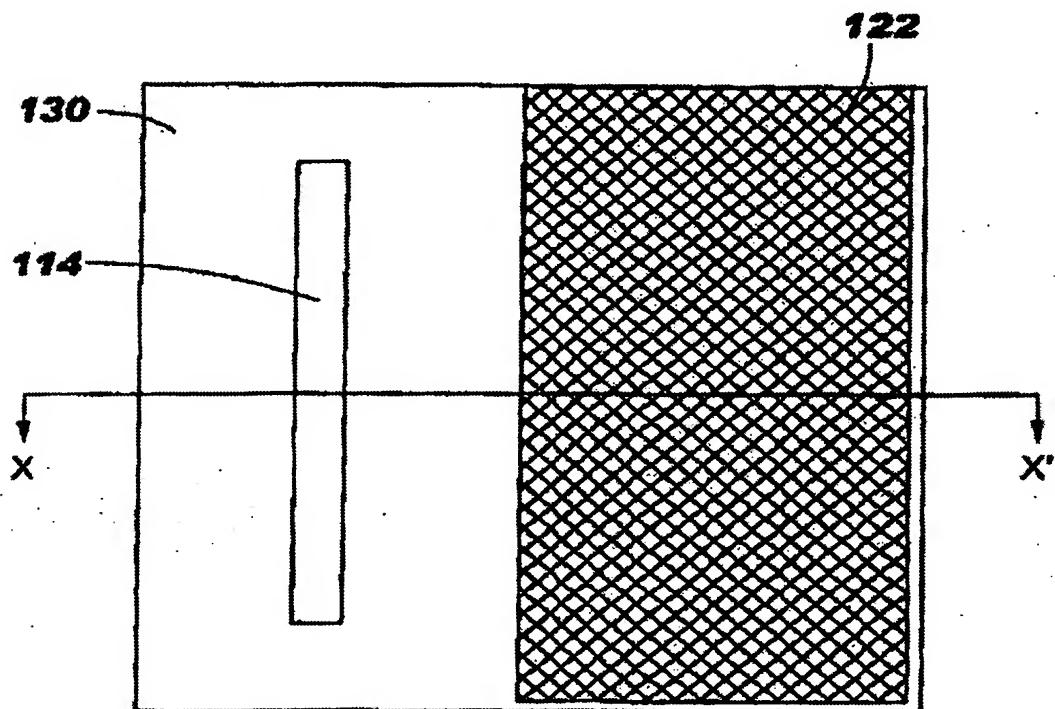


FIG. 13A

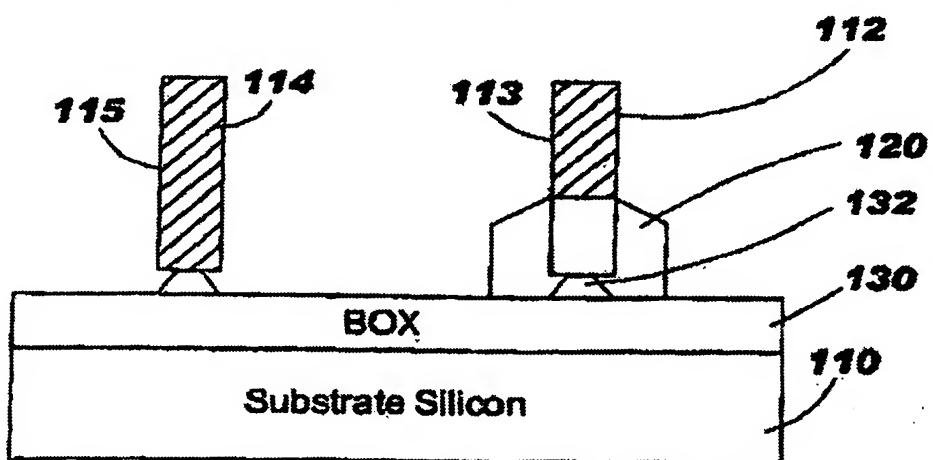
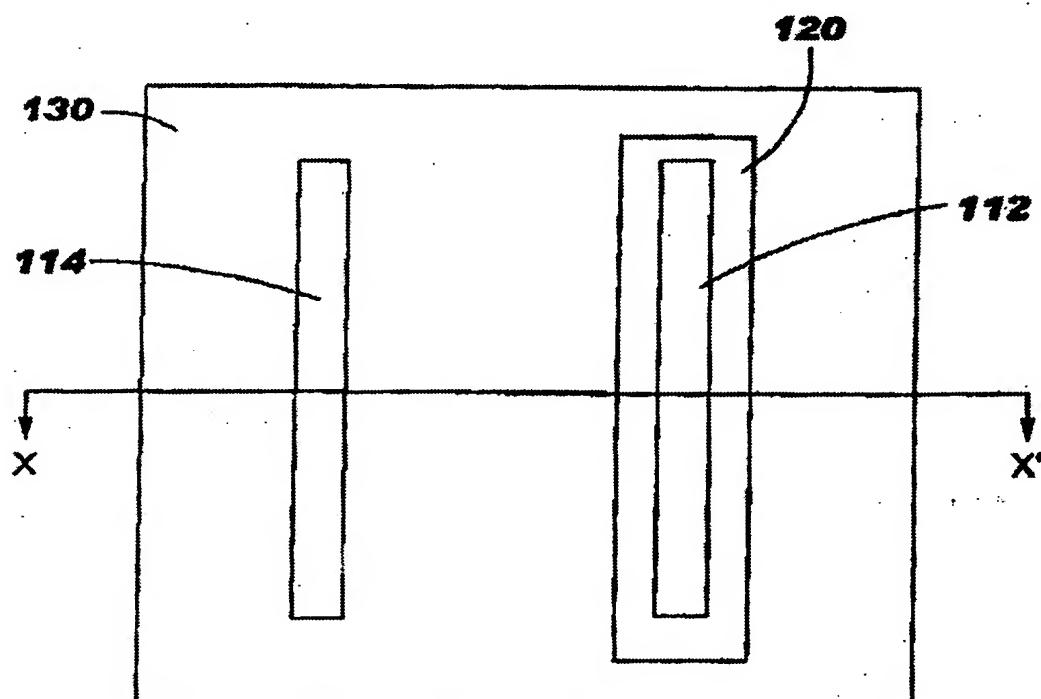


FIG. 13B



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FIG. 14A

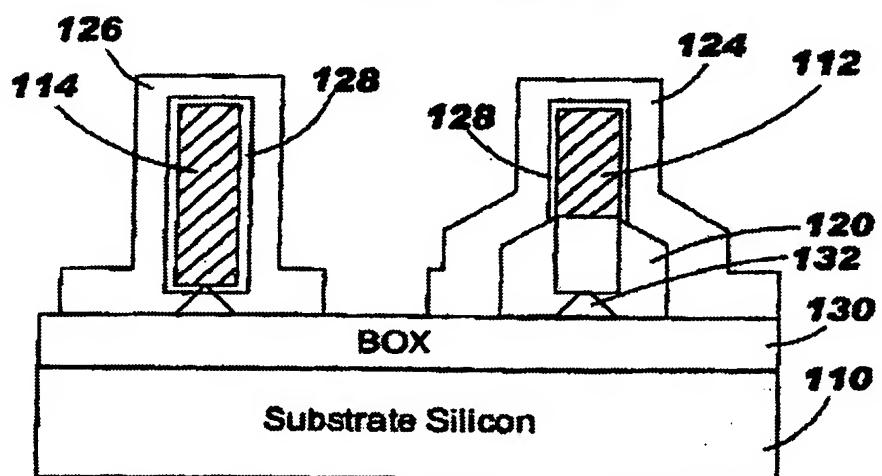


FIG. 14B

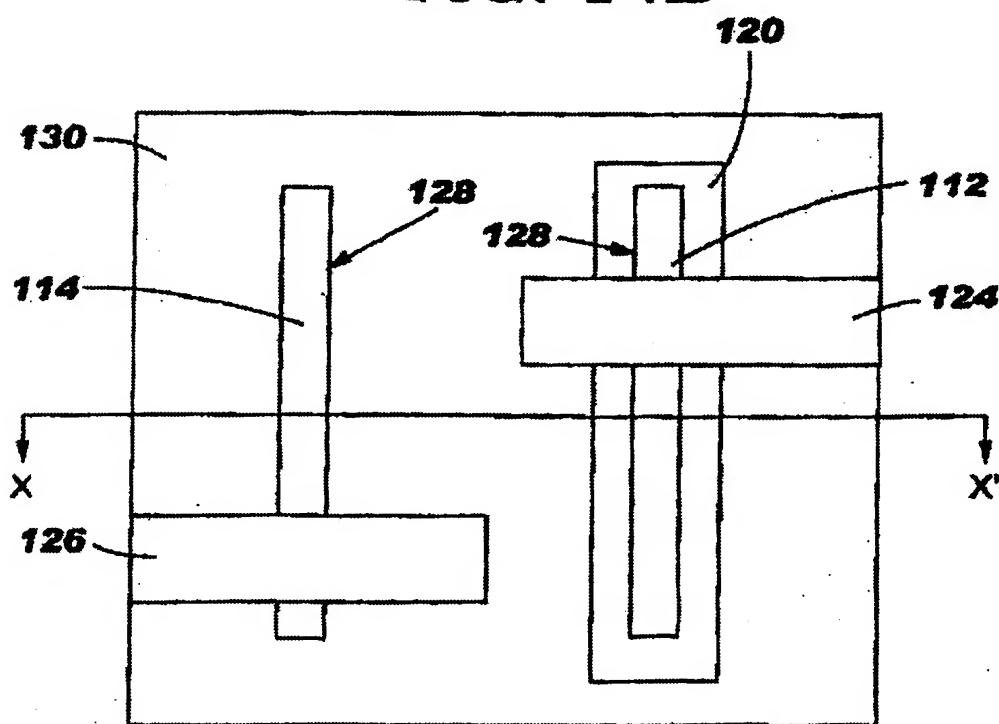


FIG. 15

